

WHAT IS CLAIMED IS:

1. A method of obtaining a head of beef cattle comprising a genetic predisposition for increased or decreased carcass or weaning weight, the method comprising the steps of:

- 5 (a) assaying genetic material from at least a first head of beef cattle for a genetic polymorphism genetically linked to promoter P1 of exon 1A of the bovine growth hormone receptor gene, wherein said polymorphism is associated with increased or decreased carcass or weaning weight; and
- (b) selecting a head of beef cattle comprising said polymorphism.

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2. The method of claim 1, wherein said genetic polymorphism is further defined as genetically linked to exon 1A of the growth hormone receptor gene.

3. The method of claim 1, wherein said polymorphism is further defined as a
15 polymorphism in a portion of the genome of said head of beef cattle corresponding to the nucleic acid sequence of SEQ ID NO:3.

4. The method of claim 1, further defined as comprising assaying a plurality of beef
cattle for said polymorphism.

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5. The method of claim 1, wherein said polymorphism comprises a simple sequence length polymorphism.

6. The method of claim 5, wherein said simple sequence length polymorphism
25 comprises a thymine-guanine dinucleotide repeat.

7. The method of claim 6, wherein said thymine-guanine dinucleotide repeat is further defined as flanked by the nucleic acid sequences of SEQ ID NO. 1 and SEQ ID
NO. 2.

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8. The method of claim 7, wherein said selecting comprises selecting a head of beef cattle comprising at least 12 copies of said thymine-guanine dinucleotide repeat.

5 9. The method of claim 7, wherein said selecting comprises selecting a head of beef cattle comprising between about 16 and about 20 copies of said thymine-guanine dinucleotide repeat.

10 10. The method of claim 7, wherein said selecting comprises selecting a head of beef cattle comprising less than 12 copies of said thymine-guanine dinucleotide repeat.

11. The method of claim 5, wherein said assaying is further defined as PCR.

12. The method of claim 5, wherein said assaying is further defined as comprising gel electrophoresis.

15 13. The method of claim 12, wherein said assaying comprises identifying specific amplification products by size.

20 14. The method of claim 1, wherein said head of beef cattle is further defined as a *Bos indicus* head of beef cattle.

15. The method of claim 1, wherein said head of beef cattle is further defined as a *Bos taurus* head of beef cattle.

25 16. The method of claim 1, wherein said polymorphism is further defined as a restriction fragment length polymorphism, simple sequence length polymorphism, amplified fragment length polymorphism, single nucleotide polymorphism or isozyme.

30 17. The method of claim 1, wherein said polymorphism is associated with increased carcass weight.

18. The method of claim 1, wherein said polymorphism is associated with decreased carcass weight.

19. The method of claim 1, wherein said polymorphism is associated with increased weaning weight.

20. The method of claim 1, wherein said polymorphism is associated with decreased weaning weight.

21. The method of claim 1, wherein said genetic material comprises genomic DNA.

22. The method of claim 1, wherein said genetic material is obtained from a developing fetus.

23. The method of claim 1, wherein said genetic material is obtained *in vitro*.

24. The method of claim 1, wherein said genetic material is obtained from an embryo.

25. The method of claim 24, wherein said selecting comprises embryo transfer of said embryo.

26. A method of breeding beef cattle to increase the probability of obtaining a progeny head of beef cattle comprising a predisposition for increased or decreased carcass or weaning weight, comprising the steps of:

- (a) selecting a first parent head of beef cattle comprising a genetic polymorphism genetically linked to promoter P1 of exon 1A of the bovine growth hormone receptor gene, wherein said polymorphism is associated with increased or decreased carcass or weaning weight; and
- (b) breeding said first parent head of beef cattle with a second parent head of beef cattle to obtain at least a first progeny head of beef cattle comprising

said polymorphism associated with a genetic predisposition for increased carcass weight or weaning weight.

27. The method of claim 26, further comprising selecting said second parent head of
5 beef cattle based on a genetic polymorphism genetically linked to promoter P1 of exon
1A of the bovine growth hormone receptor gene, wherein said polymorphism is
associated with increased or decreased carcass or weaning weight.

28. The method of claim 26, wherein said genetic polymorphism is further defined as
10 genetically linked to exon 1A of the growth hormone receptor gene.

29. The method of claim 26, wherein said polymorphism is further defined as a
polymorphism in a portion of the genome of said head of beef cattle corresponding to the
nucleic acid sequence of SEQ ID NO:3.
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30. The method of claim 26, wherein said polymorphism comprises a simple
sequence length polymorphism.

31. The method of claim 30, wherein said simple sequence length polymorphism
20 comprises a thymine-guanine dinucleotide repeat.

32. The method of claim 31, wherein said thymine-guanine dinucleotide repeat is
further defined as flanked by the nucleic acid sequences of SEQ ID NO. 1 and SEQ ID
NO. 2.
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33. The method of claim 32, wherein said selecting comprises selecting a head of beef
cattle comprising at least 12 copies of said thymine-guanine dinucleotide repeat.

34. The method of claim 32, wherein said selecting comprises selecting a head of beef
30 cattle comprising between about 16 and about 20 copies of said thymine-guanine
dinucleotide repeat.

35. The method of claim 32, wherein said selecting comprises selecting a head of beef cattle comprising less than 12 copies of said thymine-guanine dinucleotide repeat.
- 5 36. The method of claim 30, wherein said selecting comprises PCR.
37. The method of claim 30, wherein said selecting comprises gel electrophoresis.
38. The method of claim 37, wherein said selecting comprises identifying specific
10 amplification products by size.
39. The method of claim 26, wherein one or both of said first parent head of beef cattle and said second parent head of beef cattle is further defined as a *Bos indicus* head of beef cattle.
- 15 40. The method of claim 26, wherein one or both of said first parent head of beef cattle and said second parent head of beef cattle is further defined as a *Bos taurus* head of beef cattle.
- 20 41. The method of claim 26, wherein said polymorphism is further defined as a restriction fragment length polymorphism, simple sequence length polymorphism, amplified fragment length polymorphism, single nucleotide polymorphism or isozyme.
42. The method of claim 26, wherein said polymorphism is associated with increased
25 carcass weight.
43. The method of claim 26, wherein said polymorphism is associated with decreased carcass weight.
- 30 44. The method of claim 26, wherein said polymorphism is associated with increased weaning weight.

45. The method of claim 26, wherein said polymorphism is associated with decreased weaning weight.

5 46. The method of claim 26, wherein said first parent head of beef cattle is the sire and said second parent head of beef cattle is the dam.

47. The method of claim 26, wherein said first parent head of beef cattle is the dam and said second parent head of beef cattle is the sire.

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48. The method of claim 26, further defined as comprising crossing said progeny head of beef cattle with a third head of beef cattle to produce a second generation progeny head of beef cattle.

15 49. The method of claim 26, further defined as comprising repeating step (a) and step (b) from about 2 to about 10 times.

50. The method of claim 49, wherein said first parent head of beef cattle is selected from a progeny head of beef cattle resulting from a previous repetition of said step (a) and said step (b) and wherein said second parent head of beef cattle is from a selected cattle breed into which one wishes to introduce said genetic predisposition for increased or decreased carcass or weaning weight.

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